REMARKS

Favorable consideration of this Application as presently amended and in light of the following discussion is respectfully requested.

After entry of the foregoing Amendment, Claims 1-19 and 23-30 are pending in the present Application. Claims 20-22 have been canceled without prejudice or disclaimer. Claims 24-30 are new. Claims 7, 14, 17-19, and 23 have been amended to address cosmetic matters of form. Since all the elements of the claims were earlier claimed, or inherent in the claims, as examined, it is respectfully requested that the Examiner enter the response on the record. The response will present the Applicant's position in a better form for appeal. No new matter has been added.

By way of summary, the Official Action presents the following issues: Claim 22 stands rejected under 35 U.S.C. § 112, second paragraph, allegedly being indefinite; Claims 18 and 21 stand rejected under 35 U.S.C. §102 as being anticipated by Yamamoto et al. (U.S. Patent No. 6,700,865, hereinafter Yamamoto); Claims 19, 20, and 23 stand rejected under 35 U.S.C. § 102 as being anticipated by Greenstein et al. (U.S. Patent No. 6,131,016, hereinafter Greenstein); and Claims 1-17 stand allowed.

Applicant appreciatively acknowledges the identification of allowable subject matter.

Applicant thanks the Examiner for the courtesy of the interview extended to the Applicant's representative on June 9, 2006. During the interview, the rejections noted in the outstanding Official Action were discussed. However, no agreement was reached pending the Examiner's further review, and a response as filed. Comments presented during the interview are reiterated below.

REJECTION UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

The outstanding Official Action has rejected Claim 22 under 35 U.S.C. § 112, second paragraph, allegedly being indefinite. As Applicant has canceled Claim 22, Applicant respectfully submits that this rejection has been rendered moot.[1]

REJECTION UNDER 35 U.S.C. § 102

The outstanding Official Action has rejected Claims 18 and 21 under 35 U.S.C. §102 as being anticipated by Yamamoto. The Official Action contends that Yamamoto discloses all of the Applicant's claim limitations. Applicant respectfully traverses the rejection.

By way of background, in single carrier communication systems, phase comparison is typically done by comparison of pilot symbols. Orthogonal frequency division multiplexing (OFDM) systems are known in which adaptive antenna arrays are utilized. In such systems, co-channel interference is present and is estimated by using a two-pass process that expands the temporal scope and considers pass, present, and future channel estimations during parameter estimations. Temporal filters optimize parameter estimation based upon correlation of received signals at the receiver side of the OFDM system.[2]

In light of at least the above deficiencies in the art, the present invention is provided. With at least the above object in mind, a brief comparison of the claimed invention, in view of the cited reference, is believed to be in order.

Applicant's amended Claim 18 recites, *inter alia*, a communication device for transmitting and/or receiving OFDM signals in a multicarrier transmission system, including:

[1] However, Applicant notes that the cancellation of this claim is not in response to the rejection, and point to the text of Fig. 5, which clarifies the claimed matrix.
[2] Application at pages 1-2.

> . . . a processing device for calculating subcarrier phases of each of said plurality of subcarriers respectively and adjusts said subcarrier phases so as to reduce a multipath fading in the multicarrier transmission system.

Yamamoto describes a diversity receiver for compensating multi-path fading characteristics. As shown in Fig. 5, the receiver includes an OFDM demodulation circuit (601). The OFDM demodulation circuit includes a phase information detection circuit (608) for detecting the phase of the propagation path. As can be appreciated by this block diagram, fast fourier transform (FFT) circuit (605) transforms the received signals from the time domain to the frequency domain. Accordingly, the signals provided to the phase information detection circuit (608) is a time domain signal. Thus, the phase information detected by this circuit is a phase of a propagation channel.[3] As can be appreciated, the subcarriers are separated an outputted by the OFDM circuit by subcarrier demodulation circuit (606).[4]

Conversely, in an exemplary embodiment of the Applicant's invention, an OFDM transmission system is provided, such that OFDM signals are received through a plurality of antenna elements via a plurality of subcarriers. A processing device of the OFDM system calculates subcarrier phases of each of the plurality of subcarriers used for the multicarrier transmission of the OFDF signals, and, adjusts each of the subcarrier phases of the plurality of subcarriers in accordance with the calculated subcarrier phases. In this way, the subcarrier phases are adjusted to reduce multipath fading in the multicarrier transmission system. Yamamoto does not disclose, or suggest, adjusting phases of subcarrier signals, but, instead, adjusting the phase of a propagation channel. Likewise, as Yamamoto only detects a phase of a propagation path at a receiver end, it cannot disclose or suggest applying a calculation phase result to a transmission process, as recited in Applicant's amended Claim 18.

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[3] Yamamoto at Fig. 1; column 4, lines 39-52.
[4] Yamamoto at column 4, lines 45-59.

Accordingly, Applicant respectfully requests that the rejection of Claim 18 under 35 U.S.C. § 102 be withdrawn.

The outstanding Official Action has rejected Claims 19, 20, and 23 under 35 U.S.C. § 102 as being anticipated by Greenstein. The Official Action contends that Greenstein discloses all of the Applicant's claim elements. Applicant respectfully traverses the rejection.

Greenstein discloses a system for transmitting multi-carrier OFDM signals, including pilot tones. As shown in Fig. 2B, the downlink receiver, or terminal, performs differential phase detection of successive received pilot tones. In operation, the receiving terminal compares the strength of successive received pilot tones, and, determines which of the channels, that is the air channels associated with the respective transmit antenna, is currently carrying the stronger pilot tone. The terminal then sends this information back to the base station to select a corresponding transmission antenna.[5] As the pilot channel is representative of a cluster of subcarriers, the phase adjustment process is performed with respect to the propagation channels depending on the detected phase of the pilot tone. As shown in Fig. 2A, the waiting factors (w1) and (w2) are single values, which are applied to the propagation channel as a whole.

As noted above, in an exemplary embodiment of the Applicant's invention, subcarrier phases are adjusted in accordance with information concerning subcarrier phases, in some cases, on the transmission side. Likewise, as shown in Fig. 7 (adjusting unit 19), and, as recited in the Applicant's claims, each individual subcarrier is adjusted in phase. As Greenstein does not disclose, or suggest, adjusting individual subcarrier phases of an OFDM transmission system, but, instead, a pilot tone, Applicant respectfully submits that Applicant's amended Claim 23 is patently distinguished over the cited reference.

[5] Greenstein at column 4, lines 53-63.

Accordingly, Applicant respectfully requests that the rejection of Claim 23 under 35 U.S.C. § 102 be withdrawn.

NEW CLAIMS

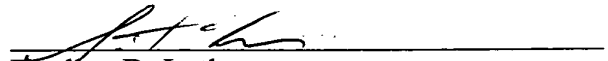
New Claims 24-30 recite more detailed aspect of the Applicant's invention, in which the phase adjustment may be implicitly performed at the transmission side, or, explicitly performed by providing the phase information to a reception side. Likewise, these claims embrace the distinctions cited above, and, at least for these reasons, are believed to be allowable over the cited references.

CONCLUSION

Consequently, in view of the foregoing amendment and remarks, it is respectfully submitted that the present Application, including Claims 1-19 and 23-30, is patently distinguished over the prior art, in condition for allowance, and such action is respectfully requested at an early date.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



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